DRAFT JOINT RESTORATION PLAN
and
ENVIRONMENTAL ASSESSMENT
for the
LOWER FOX RIVER AND GREEN BAY AREA

TRUSTEES:	Wisconsin Department of Natural Resources Oneida Tribe of Indians of Wisconsin Michigan Attorney General Menominee Indian Tribe of Wisconsin Department of the Interior Fish and Wildlife Service, Bureau of Indian Affairs Department of Commerce National Oceanic and Atmospheric Administration
LEGAL AUTHORITY:	Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (as amended) Federal Water Pollution Control Act (Clean Water Act)(as amended) Natural Resource Damage Assessment, 43 Code of Federal Regulations, Part 11 National Environmental Policy Act, 42 U.S.C. §§4321-4347
RESPONSIBLE FEDERAL AGENCIES:	Region 3, U.S. Fish and Wildlife Service, lead agency National Oceanic and Atmospheric Administration, cooperating agency Bureau of Indian Affairs, cooperating agency
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CHAPTER 1
PURPOSE AND NEED FOR THE PROPOSED ACTION

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, more commonly known as the federal "Superfund" law) [42 USC § 9601, *et seq*.] and the Federal Water Pollution Control Act (CWA, commonly known as the Clean Water Act) [33 USC § 1251, *et seq*.] authorize States, federally recognized Tribes, and certain federal agencies that have authority to manage or control natural resources, to act as "trustees" on behalf of the public, to restore, rehabilitate, replace, and/or acquire natural resources equivalent to those harmed by hazardous substance releases. The State of Wisconsin, the State of Michigan, the Menominee Indian Tribe of Wisconsin, the Oneida Tribe of Indians of Wisconsin, the United States Department of the Interior (represented by the United States Fish and Wildlife Service and the Bureau of Indian Affairs) and the United States Department of Commerce (represented by the National Oceanic and Atmospheric Administration) (collectively, the "Co-trustees") have worked together, in a cooperative process, to determine what is necessary to address natural resource injuries caused by past releases of polychlorinated biphenyls (PCBs) into the Lower Fox River and Green Bay assessment area[1] (Figure 1). Natural resource damages received, either through negotiated or adjudicated settlements, must be used to restore, rehabilitate, replace and/or acquire the equivalent of those natural resources that have been injured.

1.1 Purpose

The purpose of this Environmental Assessment is to consider alternative actions which will restore, rehabilitate, replace, and/or acquire the equivalent of any natural resources and services injured by the release of PCBs into the Lower Fox River and Green Bay environment, pursuant to applicable State, Tribal, and Federal laws and regulations. This document also serves as the Restoration Plan for implementing the selected Alternative as required under CERCLA regulations. However, the completion of this Restoration Plan does not constitute pre-approval of any specific Wisconsin Department of Natural Resources projects. All normal Wisconsin Departmental project identification and approval processes must be followed for projects funded under this plan.

1.2 Need

Any selected Alternative must be consistent with statutory mandates and regulatory procedures that specify that recovered damages are used to undertake feasible, safe, and cost-effective projects that address injured natural resources, consider actual and anticipated conditions, have a reasonable likelihood of success, and are consistent with applicable laws and policies.

[1]The assessment area for the Lower Fox River and Green Bay Natural Resource Damage Assessment (NRDA) includes the Lower Fox River and Green Bay and other areas containing natural resources potentially injured by hazardous substances released to the Lower Fox River.

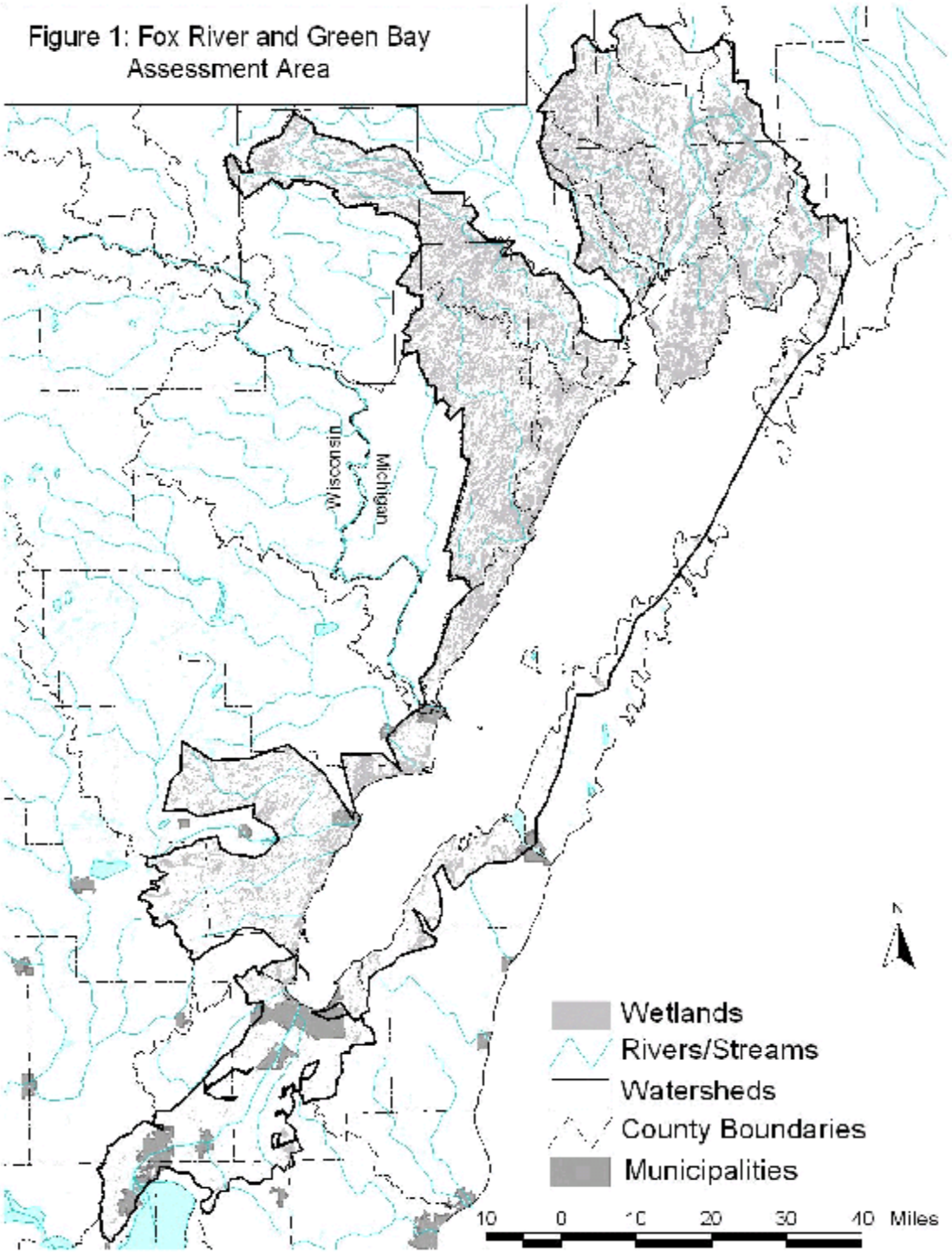

Figure 1 The assessment area for the Lower Fox River and Green Bay area includes the 39 miles of the Lower Fox River, adjacent floodplain and ecologically associated uplands, all of Green Bay and adjacent coastal wetlands and tributaries upstream to the first impoundment for both the River and the Bay, including the adjacent floodplains and ecologically associated uplands depicted within the black border.

CERCLA requires the federal government to promulgate regulations for developing natural resource damage claims. The Natural Resource Damage Assessment (NRDA) regulations [40 CFR § 11] outline restoration planning, providing that restoration plans should consider ten factors (identified at 43 CFR § 11.82) when evaluating and selecting among possible projects to restore or replace injured natural resources. The factors below are part of the needs that will be used to select an Alternative and to subsequently select projects within an Alternative.

1. Technical feasibility
2. The relationship of the costs of the alternative to the expected benefits
3. Cost-effectiveness
4. The results of actual or planned response actions
5. The potential for additional injury resulting from the proposed actions
6. The natural recovery period
7. Ability of the resources to recover with or without alternative actions
8. Potential effects of the action on human health and safety
9. Consistency with relevant federal, state, and tribal policies
10. Compliance with applicable federal, state, and tribal laws.

There is a need for the selected Alternative to restore, rehabilitate, replace and/or acquire the equivalent of those natural resources injured by the release of PCBs. The Lower Fox River and Green Bay ecosystem is a complex community of fish, wildlife, plants and humans. The Co-trustees need to consider as much of the watershed as possible and address areas of potential improvement for the ecosystem as a whole.

1.3 Decisions that Need to be Made

The U.S. Fish and Wildlife Service's Region 3 Regional Director, designated federal Authorized Official, in consultation with the authorized representatives of the Co-trustees for this site will select one of the alternatives analyzed in detail and will determine, based on the facts and recommendations contained herein, and public comment, whether this Environmental Assessment (EA) is adequate to support a Finding of No Significant Impact (FONSI) decision, or whether an Environmental Impact Statement (EIS) will need to be prepared. The federal Authorized Official (AO) is the Department of the Interior official delegated the authority to act on behalf of the Secretary to conduct a natural resource damage assessment, restoration planning and implementation. The AO represents the interests of the Department, including all affected Bureaus.

1.4 Federal Agency Status

Each Federal agency is required to comply with the National Environmental Policy Act (NEPA) prior to commencing an action. Since the Region 3 Regional Director for the U.S. Fish and Wildlife Service is the federal AO, the U.S. Fish and Wildlife Service has taken the lead for NEPA purposes (40 CFR §1501.5) in developing the environmental assessment. The Bureau of

Indian Affairs and National Oceanic and Atmospheric Administration, the other federal trustees, have recently been formally asked to participate in the combined Restoration Plan and Environmental Assessment as cooperating agencies (ibid. § 1501.6) for NEPA purposes. Informal responses from each agency indicate that they agree to be cooperating agencies. Formal responses to this request have not been received as the draft document was released for public comment. Future formal responses from these agencies will be placed on the same web site where this Joint Restoration Plan and Environmental Assessment for the Lower Fox River and Green Bay Area is posted (http://midwest.fws.gov/NEPA).

1.5 Background

Starting in the mid-1950s, Lower Fox River paper companies and associated waste treatment facilities released PCBs to the Lower Fox River. These releases comprised byproducts of a process that made, converted, or recycled carbonless copy paper containing PCBs. Lower Fox River paper companies contributed to the releases, including Appleton Papers Inc., National Cash Register (NCR), Georgia-Pacific (formerly Fort James and Fort Howard), P.H. Glatfelter Company, Riverside Paper Corporation, U.S. Paper Mills Corporation and Wisconsin Tissue Mills, Inc. In addition, releases occurred from Arrowhead Park Landfill and the City of Appleton and Neenah-Menasha Publicly Owned Treatment Works, all of which handled wastes received from the paper companies.

PCBs are a class of chemical compounds that have been shown to cause harmful effects to living organisms at relatively low concentrations (parts per million or parts per billion). PCBs do not readily break down in the environment, and in fact, tend to accumulate at higher and higher concentrations in the bodies of fish and other organisms, reaching levels that are many thousands of times higher than levels in their surrounding habitat. According to the Agency for Toxic Substances and Disease Registry, PCBs are considered probable human carcinogens, and are known to cause cancer in animals. PCBs are also linked to adverse health effects in humans such as developmental impairments, reduced birth weight, and reduced ability to fight infections. Reproductive failures, deformities, and behavior abnormalities in fish and wildlife have been linked to PCBs.

PCBs released from paper company facilities into the Lower Fox River are carried downstream and into Green Bay, dissolved in the water column and adsorbed to suspended sediment particles. Once PCBs enter Green Bay they are carried by the water currents that circulate through the Bay. Green Bay water circulation is complex but has an overall counterclockwise pattern. It is controlled by factors such as surface water elevation changes induced by wind and barometric pressure, wind speed and direction, river discharge, upwelling of the thermocline in Lake Michigan, thermal and density gradients between the Bay and Lake Michigan, and ice cover. (U.S. FWS and Stratus Consulting, 1999a).

The Lower Fox River is the dominant tributary to Green Bay, and the Lower Fox River plume can be tracked within the Bay. The Lower Fox River plume moves up the Bay along the eastern

shore for 20-40 km under the influences of both prevailing southwesterly winds and the Coriolis effect. Although water movement between the inner and outer bay and between Green Bay and Lake Michigan is complex, net water movement between these areas is from the inner to the outer bay and from the outer bay to Lake Michigan. Overall exchange is very high, providing a mechanism by which PCBs are transported from the inner bay to the outer bay and from Green Bay into Lake Michigan. (U.S. FWS and Stratus Consulting, 1999a).

The Wisconsin Department of Natural Resources (WDNR)(WDNR, 1999a) has estimated the total amount of PCBs released to the Lower Fox River between the mid-1950s and 1997 as approximately 300,000 kg (660,000 lb.). Direct PCB releases to the Lower Fox River began in the 1950s, increased through the 1960s, peaked in 1969, and dropped sharply after 1971. Nevertheless, the Lower Fox River continues to be the dominant source of PCBs entering Green Bay. PCBs continue to be released into the environment through surface water and sediment transport processes. An estimated 39,400 to 47,300 kg of PCBs (13-16 percent of the total released) remain in bed sediment throughout the Lower Fox River (WDNR, 1999b).

The specific injuries to the natural resources of the Lower Fox River and Green Bay have been documented in several studies including: Injuries to Surface Water Resources (U.S. FWS and Stratus Consulting, 1999b), Injuries to Fishery Resources (U.S. FWS and Stratus Consulting, 1999a), and Injuries to Avian Resources (U.S. FWS and Stratus Consulting, 1999c). Defined in the NRDA regulations, injury is an adverse biological, chemical, or physical effect on natural resources, such as death, decreased population, or lost services (hunting opportunities, ecosystem functions). Damages are the estimated dollar values of the injured resources, determined either through damage assessment studies or negotiation. The objective of the NRDA process is to compensate the public through environmental restoration for losses to natural resources that have been caused by releases of PCBs into the environment. The results of this administrative process are contained in a series of planning and decision documents that have been published for public review. See the list of pertinent documents in Appendix B.

Under CERCLA guidelines, damage settlements can only be used for "restoration" (*i.e.*, to restore, rehabilitate, replace, and/or acquire the equivalent) of trust resources injured, destroyed, or lost as a result of the release of contaminated substances from these sites. These injured resources include surface water, sediment, fish, wildlife and their supporting ecosystems, and cultural resources of the Indian tribes of the area.

The restoration plan is being developed prior to final resolution of damage claims so that existing settlement funds may be utilized to implement restoration projects. The restoration plan and environmental assessment are not intended to quantify the extent of restoration needed. The scale of restoration activity that will be undertaken as a result of this document will depend upon the funds, property and services made available through resolution of natural resource damage claims. As the Co-trustees receive settlement funds from each of the potential responsible parties and determine that a new restoration strategy is required to address compensation to the public, a supplemental document will be provided to the public designating any changes in priorities, criteria or alternatives.

CHAPTER 2
ALTERNATIVES, INCLUDING THE PROPOSED ACTION

2.1 Alternatives not Considered for Detailed Analysis

2.1.1 PCB Removal

Removal of PCBs from the Lower Fox River and Green Bay ecosystem can reduce the number of years that fish consumption advisories, waterfowl consumption advisories, and water quality standards and injuries to wildlife occur. However, the Wisconsin Department of Natural Resources (WDNR) and the U.S. Environmental Protection Agency (EPA) have developed a plan to remove a substantial amount of PCB-contaminated sediment from the Lower Fox River and Green Bay. The Co-trustees believe that WDNR and EPA, in their capacity as hazardous substance response agencies, are currently in the best position for removal or immobilization of PCBs to adequately address PCB cleanup. Criteria used by the response agencies to select remedial alternatives under CERCLA include technical feasibility, cost-effectiveness, effects on human health and safety, and compliance with relevant laws (U.S. EPA, 1988), which are similar to NRDA criteria that will be used by the Co-trustees. The Co-trustees concluded that further PCB removal, beyond that selected as part of the CERCLA response, is unlikely to pass the NRDA's feasibility, cost-benefit, and cost-effectiveness criteria. Consequently, this alternative would likely be infeasible or unreasonable; therefore, it received no further analysis.

2.2 Alternatives Carried Forward for Detailed Analysis

2.2.1 Alternative A: No Action

The No Action alternative, required by the National Environmental Policy Act (NEPA), consists of expected conditions under current programs pursued outside the NRDA process by tribes and agencies. It is the baseline against which other actions can be compared. If this alternative were implemented, the Co-trustees would not initiate specific actions to restore injured natural resources or compensate the public losses from ongoing natural resource injuries from the release of PCBs into the environment. Existing environmental degradation not directly related to PCB releases would continue to occur, and perhaps worsen under Alternative A. The tribes and state and federal agencies would continue to manage, conserve and protect the Lower Fox River and Green Bay environment as outlined in current programs and regulations and within current budget constraints.

2.2.2 Criteria and Priorities for Restoration Project Categories under Alternatives B and C

Preference will be given to projects, or aspects of existing Co-trustees' projects, that are not already being implemented or have no planned funding under other programs. Although the Co-trustees will use restoration planning efforts completed by other programs, preference is given to projects that would not otherwise be implemented without NRDA restoration funds. Natural

resource-based restoration projects will be consistent with priorities, policies, missions, goals and previous planning (*e.g.*, WDNR Basin Management Plans, Endangered Species Recovery Plans) of the Co-trustees.

Wherever possible, natural habitat functions that are self-sustaining and essential to maintain the habitat, will be restored or enhanced and protected. Projects that provide long-term benefits that begin immediately after project implementations are preferred assuming that any operation and maintenance activities required for long-term success will be conducted.

Restoration projects that provide a broad scope of measurable benefits to a wide area or population are important. Those that are focused on a limited set of benefits to a limited area or population are less preferred. Natural resource-based restoration projects should not have disproportionate high costs or low benefits to a localized population. Projects that benefit more than one injured natural resource will also be given priority.

Projects that use reliable, proven methods are preferred to those that rely on experimental, untested methods. Other factors that can affect project success, such as validity of assumptions inherent to the project approach, will also be important to the Co-trustees. The restoration projects will be technically feasible and completion of the project will be feasible within the proposed budget. Natural resource-based restoration projects with a high ratio of expected benefits to expected cost will be preferred. This aspect may be assessed relative to other proposed projects that benefit the same resource.

Preservation or restoration of specific areas or resources that have appreciable cultural value to the Indian tribes of the area are important to the Co-trustees. Individual projects will be evaluated for their tribal cultural importance, and the preservation of such sites may be considered toward the preservation or restoration of habitat or other natural areas.

Cultural resources are those parts of the physical environment, natural and built, that have cultural value to some kind of sociocultural group and those nonmaterial human social institutions. Cultural resources include historic sites, archeological sites and associated artifacts, sacred sites, traditional cultural properties, cultural items (human remains, funerary objects, sacred objects, and objects of cultural patrimony), and buildings and structures. Most cultural resources concerns can be identified through the Section 106 process of the National Historic Preservation Act (NHPA). To reduce paperwork, avoid duplication, and expedite decision-making, the Section 106 process as defined in 36 CFR Part 800 will be followed for purposes of the environmental assessment.

The U.S. Fish and Wildlife's Region 3 Regional Director, as the responsible Federal agency official (36 CFR § 800.2(a)), will ensure identification of cultural resources and historic properties within the areas of potential effect. Absent objections from Historic Preservation Officers (HPOs) or from other interested persons the NHPA recognizes as having legal standing (800.2(c)(3), (4), and (5)) in land acquisition projects, projects involving ground disturbance, and

projects impacting buildings and structures 50 years and older, the U.S. Fish and Wildlife Service Restoration Coordinator will:

1) consult with the appropriate HPO for each specific project (undertaking) for the purpose of identifying cultural resources in the area of potential effect and obtain from the HPOs a determination of no historic properties or no effect on historic properties as outlined in Section 106 of the National Historic Preservation Act,
2) notify appropriate Indian tribes about the project, and
3) provide the Regional Historic Preservation Officer with sufficient documentation to determine if the Section 106 process has been completed prior to project implementation.

Preference will be given to projects that avoid or minimize additional natural resource injury or environmental degradation. The Co-trustees will require that appropriate permits are obtained and regulations followed. All projects selected for implementation will comply with applicable and relevant laws, policies and regulations. To assure that federally-listed threatened or endangered species will not be adversely affected, or proposed species are not jeopardized, the Co-trustees will require that the guidelines outlined in Appendix C are followed as NRDA restoration activities are implemented.

Preservation of habitats through acquisition of land or easements will only be from willing sellers or participants. Landowners will be under no obligation to sell to any of the governments associated with the Co-trustees. Neighbors adjacent to land purchased for preservation under this restoration plan will retain all of their current rights to their land. The government agencies are required to pay fair market value for land purchased. Fair market value will be determined through established appraisal procedures. Where land is occupied, relocation assistance may be available.

Projects providing benefits that are able to be quantified and the success of the project determined will have a higher priority than projects that do not. Restoration projects should include an evaluation of success component to document whether the restoration actions are effective in providing the public with similar services and values to those lost because of the release of PCBs into the environment. A timeline outlining the implementation and stabilization of the restoration project will be used by the Co-trustees to determine completion and success of the project. Overall success of the Co-trustees restoration plan will depend upon success of each restoration project.

2.2.3 Alternative B: Natural Resource-Based Restoration Within the Assessment Area

Alternative B involves projects that will directly restore injured natural resources and also will provide enhanced ecosystem services as compensation for losses caused by PCBs. CERCLA authorizes trustees to replace or acquire natural resources equivalent to those injured by hazardous substance direct releases, in lieu of or in addition to, direct restoration of the injured resources themselves. Natural resources may also be rehabilitated with actions that increase the ecological integrity or viability of resources.

Projects within this alternative will only be implemented in the assessment area that includes the 39 miles of the Lower Fox River, the adjacent floodplain and ecologically associated uplands, and all of Green Bay and its adjacent coastal wetlands and tributaries upstream to the first impoundment for both the river and the Bay, including the adjacent floodplains and ecologically associated uplands (Figure 1). Natural resource-based restoration projects include activities or categories such as wetland reestablishment or preservation, which would provide habitat for fish and wildlife species; aquatic habitat quality improvement projects that would restore and enhance aquatic habitat and public recreational services; and direct resource restoration projects, such as projects designed to improve fish reproduction and recruitment.

The Co-trustees prefer a mix of natural resource restoration projects to provide a broad array of natural resource services throughout the Lower Fox River and Green Bay environment and to enhance a select group of outdoor recreational activities that have natural resource benefits to local communities. Thus, a variety of goals are supported, rather than just one type of goal. Selecting a mix of restoration projects from the defined categories below allows for more flexibility for cost-effectiveness and feasibility due to different constraints related to the ecology of the area or ability to find willing participants and sellers.

Natural resource-based geographical priorities for all restoration project categories under Alternative B are as follows:

1) the 39 miles of the Lower Fox River, adjacent floodplain and ecologically associated uplands,
2) Green Bay and adjacent coastal wetlands, and
3) tributaries to the Lower Fox River and Green Bay upstream to the first impoundment, including adjacent floodplains and ecologically associated uplands.

The Co-trustees expect that geographical priorities will be influenced primarily by the following key factors:

1) proximity (areas closer to the River and Bay are preferred);
2) quality of restoration opportunities (areas with substantial ecological opportunities are preferred);
3) relationship to losses (areas with restoration opportunities that address services and values similar to those lost due to the release of PCBs are preferred); and
4) cost and cost-effectiveness (areas with lower cost per services or values are preferred).

2.2.3.1 *Wetland and Associated Upland Habitat Preservation, Reestablishment or Enhancement Projects*

Wetland and ecologically associated uplands will provide increased spawning and nursery habitats, nesting and increased food for a wide variety of fish, birds and other wildlife. This provides ecological functions similar to, but not necessarily the same as those injured by PCBs. The Co-trustees' initial goal is to preserve approximately 9,900 acres and reestablish or enhance approximately 3,300 acres in the Lower Fox River and Green Bay environment. Available

settlement funds, restoration opportunities and restoration costs will influence this goal over time.

To preserve wetland and associated uplands, the Co-trustees will focus on acquiring and managing coastal wetlands, wetlands in areas of higher population growth, and wetlands of high natural quality. Final selection of specific wetlands that would be preserved will include consideration of the ecological value of the wetland habitats, inherent improvement of water quality, ownership/protection opportunities, geographic/ecological diversity, local/regional planning, citizens' concerns and the ability to find willing sellers. Preservation will be obtained through fee title purchase or conservation easements in perpetuity having a higher priority than easements with a duration of years. Land acquired will be deeded to individual state, tribal, federal, local governments, land trusts, or conservation non-government organizations after following specific procedures and standards set for each governmental entity. Payment in lieu of taxes will be made on land deeded to government parties for lands acquired in the State of Wisconsin. For the State of Michigan the Co-trustees are only considering deeding land to the Michigan Department of Natural Resources or possibly the federal government, land trusts or conservation non-government organizations. Payment in lieu of taxes will also be made on land deeded to these governmental parties in Michigan. In the future, if the Co-trustees determine that acquiring fee-title ownership would benefit local government units in Michigan a supplemental document will be published analyzing effects on the human and natural environment. While the primary purpose of the preservation of this land is to protect fish and wildlife habitats, portions of the acquired properties may be used by the public for natural resource based recreational activities such as wildlife viewing, hiking, fishing or hunting.

Wetland and ecologically associated upland reestablishment and enhancement will help replace habitats that have been lost or destroyed in the Lower Fox River and Green Bay ecosystem. The Co-trustees will focus their efforts on areas where hydrological alterations or other modifications have destroyed or impaired former wetlands or ecologically associated upland habitats. The Co-trustees believe that this will be more effective than wetland or habitat creation where wetlands or associated upland habitats have not previously existed. The Co-trustees' wetland and upland habitat reestablishment and enhancement strategy will include, but not be limited to, primarily low impact techniques such as: closing off drainage ditches, disrupting (or not repairing) drain tile systems, and reestablishing wetland plants and other native vegetation in order to reestablish natural characteristics that have been eliminated. The Co-trustees intend to target degraded wetland and upland habitats located in bay coastal areas, within floodplains, and adjacent to existing valuable natural areas. Wetland and ecologically associated upland reestablishment and enhancement projects that will inherently improve water quality are preferred. If a specific restoration project uses alternative techniques or involves more development than described in this section, a site specific NEPA determination will be made.

2.2.3.2 *Fishery Resource Enhancement Projects*

The abundance and diversity of fish species that once inhabited the assessment area is very different from the fishery currently observed due to impacts of humans including, but not limited to overfishing, the purposeful and accidental introduction of exotic species, and the discharge or release of conventional and toxic pollutants (WDNR, 1988). The fish community is impaired as evidenced by a low abundance and diversity of top predators and native forage species in combination with the presence of exotic species such as carp, alewife and white perch. The Co-trustees' goals are self-sustaining fish populations and a healthy fish community in the Lower Fox River and Green Bay environment. The Co-trustees will focus on projects that will help to establish these goals. Available settlement funds, restoration opportunities and restoration costs will influence this goal over time.

Failed or low recruitment of important native species has contributed to the instability of the Green Bay fish community. Top fish predators are important components of a fish community to maintain stability and integrity of the fish community. The loss of top predators in Lake Michigan allowed exotic alewife to increase in abundance to the point where they are considered a nuisance and liability to society. Rehabilitation of top predators through stocking and native fish restoration can help control alewife abundance and stabilize the fluctuations in the fish community. Healthy predator populations can be effective deterrents to the continued invasion of exotic species. The Co-trustees will value well designed predator enhancement projects that restore or enhance the diversity and abundance of native predators within the assessment area. Similarly, loss of key native prey species also is an indication of lower fish community integrity. Projects that enhance the abundance and diversity of native prey fish species are desirable. Finally, projects that can effectively control the abundance and distribution of aquatic nuisance species will be considered.

2.2.3.3 *Aquatic and Near-shore Habitat Quality Improvement Projects*

Hazardous substances, such as PCBs, have impaired the water quality and the near-shore aquatic habitat of streams that are tributaries to the Lower Fox River and Green Bay. These same resources have been further damaged by encroachment and habitat fragmentation caused by land use changes and development. Specific aquatic habitat quality improvement projects will include protecting, reestablishing or enhancing, vital spawning and nursery habitat of critical native species, wildlife barrier islands, an oak savanna habitat on river islands, and stream bank corridors with native plant species and stabilization of streambanks providing for water quality improvement. The Co-trustees' goal is the protection, reestablishment, or enhancement of approximately 12,000 acres of aquatic and near-shore habitat in the Lower Fox River and Green Bay environment. Available settlement funds, restoration opportunities and restoration costs will influence this goal over time.

2.2.3.4 *Natural Resource-Based Public Use Enhancement Projects*

This category of projects includes improvements to outdoor recreational facilities at existing parks or the development of new parks associated with riverine or coastal habitat recreation, appreciation or education including:

- biking and hiking trails along the waterfront
- boat ramps
- education signage, kiosks or other installations that promote education about and appreciation of the Lower Fox River and Green Bay environment.

These facilities provide public use and enjoyment functions related to aquatic habitats that are similar to, though not the same as those impaired by the presence of PCBs in and around the Lower Fox River and Green Bay. Projects may include upgrading existing facilities or the construction of new facilities at existing parks in the area. Rather than supporting public use enhancement projects that do not have ecological benefits, the Co-trustees will support natural resource-based public use enhancement projects that direct high intensity public use activities away from ecologically sensitive areas, thus protecting or preserving the ecological integrity of a site. The Co-trustees do not anticipate nor do they wish to omit, the possibility of the development of new parks in the area. If the development of a new park becomes a reality, a supplemental NEPA document evaluating the impacts will be published. The Co-trustees will designate less than 10 percent of total settlement funds to implement improvements in park facilities located in the Lower Fox River and Green Bay environment.

2.2.4 Alternative C: Natural Resource-Based Restoration Within and Beyond the Assessment Area (Proposed Action)

This alternative includes all the categories of projects outlined in Alternate B, but will restore, rehabilitate, replace, and/or acquire the equivalent resources within the assessment area as well as outside the assessment area (restoration area) to create an alternative source for the ecological services lost or injured by the release of PCBs into the Lower Fox River and Green Bay. The restoration area will include the previously defined assessment area and habitats encompassing the lands to the headwaters of the tributaries of the Lower Fox River and Green Bay, and adjacent watersheds that support the ecological balance of bird and mammal species injured in the Lower Fox River and Green Bay system (Figure 2).

The Co-trustees recognize that basic ecological principals must be addressed to achieve maximum benefit from restoration projects within the entire Lower Fox River and Green Bay watershed area, including the headwaters of the rivers and streams that flow into the Lower Fox River and Green Bay ecosystem. However, projects closer to the Lower Fox River and Green Bay are preferred to projects located in upstream or adjacent watersheds. Therefore, geographical priorities for all project categories are as follows:

1) the 39 miles of the Lower Fox River, adjacent floodplain and ecologically associated uplands,

2) Green Bay and adjacent coastal wetlands,
3) tributaries to the Lower Fox River and Green Bay up to the headwaters, including adjacent floodplains and ecologically associated uplands, and
4) watersheds adjacent to the river systems in the first three priorities.

The Trustees expect that geographical priorities will be influenced primarily by the following key factors:

1) proximity (areas closer to the River and Bay are preferred);
2) quality of restoration opportunities (areas with substantial ecological opportunities are preferred);
3) relationship to losses (areas with restoration opportunities that address services and values similar to those lost due to the release of PCBs are preferred); and
4) cost and cost-effectiveness (areas with lower cost per services or values are preferred).

2.2.4.1 *Wetland and Associated Upland Habitat Preservation, Reestablishment or Enhancement Projects*

The only change from Alternative B within this category of projects is the extension of the restoration area for wetland and associated upland habitat preservation, reestablishment or enhancement.

2.2.4.2 *Fishery Resource Enhancement Projects*

The only change from Alternative B within this category of projects is the extension of the restoration area for fishery resource enhancement projects.

2.2.4.3 *Aquatic Habitat Quality Improvement Projects*

The only change from Alternative B within this category of projects is the extension of the restoration area for aquatic habitat quality improvement projects.

2.2.4.4 *Natural Resource-Based Public Use Enhancement Projects*

There is no change from Alternative B within this category of projects. Due to the minimal amount of funds to be used to implement projects within this category, the Co-trustees do not foresee a need to extend the implementation area to include the entire restoration area.

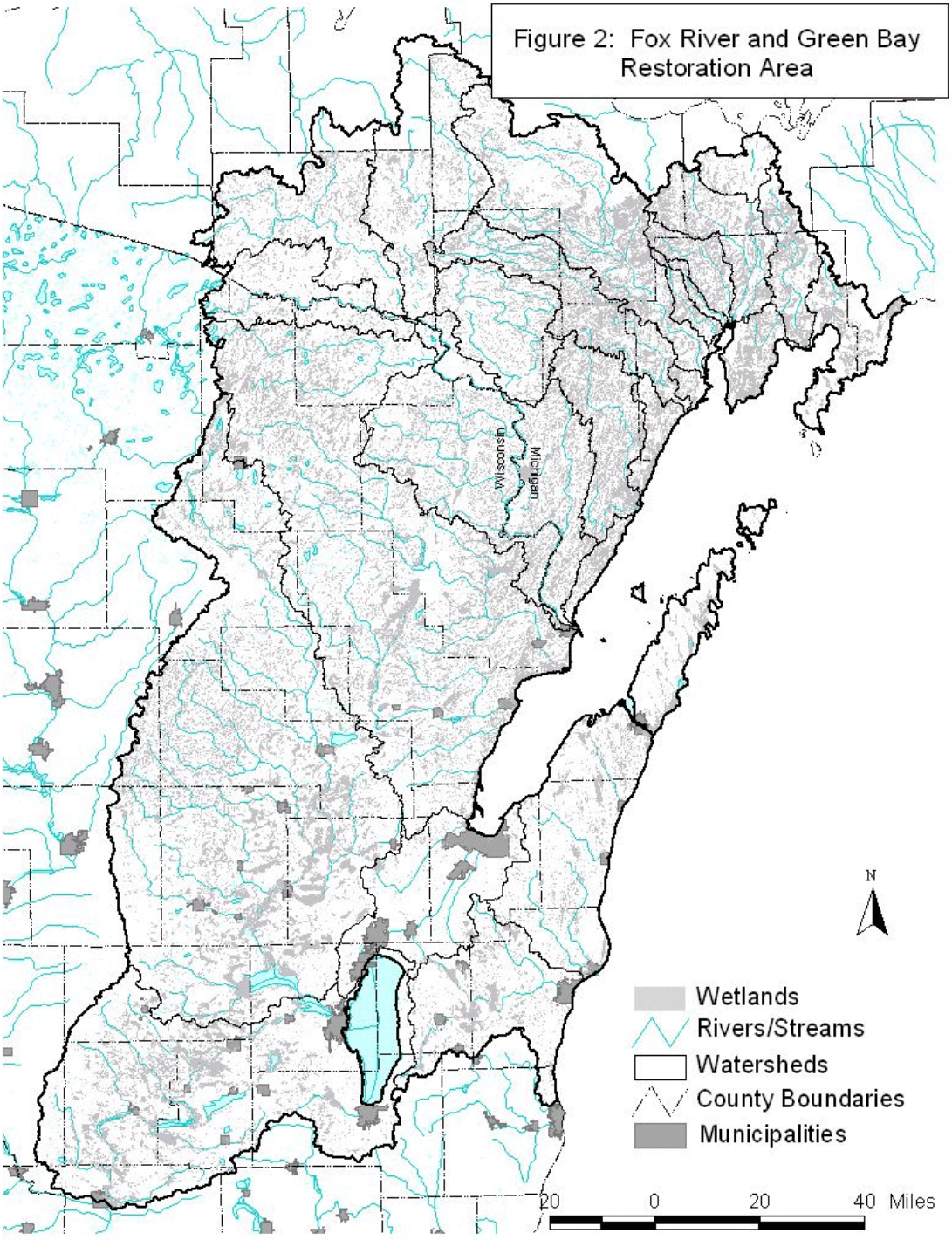

Figure 2 The restoration area for the Lower Fox River and Green Bay area includes the 39 miles of the Lower Fox River, adjacent floodplain and ecologically associated uplands, all of Green Bay and adjacent coastal wetlands, tributaries upstream to the headwaters for both the River and the Bay, including the adjacent floodplains and ecologically associated uplands and adjacent watersheds depicted within the black border.

2.3 Summary of Alternative Actions Table

Actions	**Alternative A** (No Action)	**Alternative B** (Natural Resource-Based Restoration Within the Assessment Area)	**Alternative C** (Natural Resource-Based Restoration Within and Beyond the Assessment Area (Proposed Action))
Restore, rehabilitate, replace and/or acquire the equivalent of natural resources injured from the release of PCBs into the environment and services those resources provide	No	Yes	Yes
Preservation of wetlands and associated upland habitat for public trust	No	Yes, approximately 9,900 acres from willing sellers within the Assessment Area	Yes, approximately 9,900 acres from willing sellers within and beyond the Assessment Area
Rehabilitate wetlands and associated upland habitat	No	Yes, approximately 3,300 acres restored within the Assessment Area	Yes, approximately 3,300 acres restored within and beyond the Assessment Area
Provide for enhancement of abundance and diversity of self-sustaining fish populations	No	Yes, will fund projects to improve native predators and prey along with effective control of aquatic nuisance species	Yes, same as Alternative B but over a larger geographic area
Improve aquatic habitat	No	Yes, approximately 12,000 acres of aquatic and near-shore habitat improved	Yes, same as Alternative B but over a larger geographic area
Improve outdoor recreational facilities	No	Yes, less than 10 percent of total settlement funds used primarily to improved facilities at existing parks	Same as Alternative B

CHAPTER 3
AFFECTED ENVIRONMENT

As part of the larger Lake Michigan and Great Lakes ecoregion, the Lower Fox River and Green Bay form a unique and important ecosystem. The terrestrial, wetland, and aquatic habitats of the Lower Fox River and Green Bay environment support a wide diversity of birds, fish, and mammals, including many rare, threatened, and endangered species. The health of the ecosystem and the quality of its ecological habitats are vital to the invertebrates, plants, fish, and wildlife of the area. Public uses and enjoyment of these resources also depend on the health and quality of the Lower Fox River and Green Bay environment.

3.1 Physical Characteristics

The restoration area is encompassed within northeastern Wisconsin and in the southwestern portion of the Upper Peninsula of Michigan. This area is in the following counties; Alger, Delta, Dickinson, Iron, Marquette, and Menominee Counties, Michigan and Adams, Brown, Calumet, Columbia, Door, Florence, Fond du lac, Forest, Green Lake, Kewaunee, Langlade, Manitowoc, Marathon, Marinette, Menominee, Oconto, Oneida, Outagamie, Portage, Shawano, Waupaca, Waushara, and Winnebago Counties, Wisconsin. The Lower Fox River originates at the outlet of Lake Winnebago and flows northeast for 39 miles before emptying into the bay of Green Bay. The Lower Fox River empties a drainage basin of 6,349 square miles (including drainage from the Wolf River basin). The lower river is fragmented by a series of 17 locks and 12 dams that were built in the mid 1800s to aid navigation or produce power.

Green Bay is an elongated arm of Lake Michigan partially separated from the lake by the Door County peninsula, Wisconsin and Garden Peninsula, Michigan. The bay lies northeast from the mouth of the Fox River, is 119 miles long, and has a maximum width of 23 miles. Green Bay is relatively shallow, ranging from an average of 10 to15 feet at the southwestern end to 120 feet at it deepest point. The water flowing from the Fox River flows northward up the east side of the lower Bay, with the currents in the Bay flowing in a counter clockwise direction.

The climate of the restoration area is highly seasonal and continental, with an average July air temperature of about 67 degrees Fahrenheit (F) and an average January air temperature of 20° degrees (Robbins, 1991). The average depth of soil frost in late February is about 20 inches. Annual precipitation is approximately 33 inches (Robbins, 1991).

3.2 Biological Environment

3.2.1 Habitat/Vegetation

The Lower Fox River and Green Bay environment is located within a transitional zone where plant communities typical of both colder and warmer climates converge (Curtis, 1959). Thus, Upper Green Bay is characterized by conifer forests whereas lower Green Bay and the Lower Fox

River are characterized by hardwood forests, resulting in the occurrence in the restoration area of species typical of both habitats (U.S. FWS and Stratus Consulting, 1999c). The coastal wetlands located along the bay provide key habitats for migratory and nesting birds, and the small uninhabited islands of Green Bay provide nesting sites for large colonies of breeding waterbirds such as terns and herons that are free from human disturbance and mammalian predators. Many types of wetlands are found in the Lower Fox River basin including submergent and emergent marsh, shoreland wetlands, wet meadow and forested wetlands or floodplain.

3.2.2 Listed, Proposed, and Candidate Species

Federally-listed species known to occur in the vicinity of the Lower Fox River-Green Bay restoration area include the bald eagle, Kirtland's warbler, piping plover, gray wolf, Canada lynx, Karner blue butterfly, Hine's emerald dragonfly, Pitcher's thistle, Dwarf lake iris, eastern prairie fringed orchid and Fassett's locoweed.

3.2.2.1 *Birds*

Bald eagles, large fish-eating raptors, have been a federally-listed species since 1967 and are currently listed as threatened. A dramatic recovery of eagle populations led to the July 8, 1999, U.S. Fish and Wildlife Service proposal to remove the species from the federal list of endangered or threatened wildlife. It is anticipated that this species will soon be removed from the list of federal threatened and endangered species. This species nests and winters throughout the restoration area in relation to major rivers and large bodies of water. Bald eagles generally use deciduous and mixed forest types near water and usually perch within a riparian corridor or along lake shores. They prefer areas with limited human activity. In addition to feeding on fish and the carrion of large mammals, bald eagles also feed on dead or crippled waterfowl. In 2002, eagles occupied nests and produced young in the assessment and restoration areas within Door, Brown, Oconto and Marinette counties in Wisconsin.

The Kirtland's warbler, federally-listed as an endangered species in 1973, inhabits pine and oak forests. This small, insect-eating songbird will only nest on the ground near the lower branches of large stands of young jack pines. This species has potential breeding grounds within the assessment and restoration areas in Marinette County, Wisconsin, and also has been found in Delta and Marquette counties in Michigan.

Piping plovers are small, stocky shorebirds that use wide, flat, open, sandy beaches with very little grass or other vegetation. Nesting territories often include small creeks or wetlands. The Great Lakes population of the piping plover was listed as an endangered species in 1986. In 2001, critical habitat was designated for this population. Critical habitat is a specific geographic area that is essential for the conservation of the species and may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but will be needed for its recovery. Critical habitat designated for the piping plover in the assessment and restoration areas is found in Wisconsin:

• Marinette County, lands 500 m (1,640 ft) inland from the normal high water line from the end of Leonard Street at Red Arrow Park in T30N R24E section 9 south-southeastward to the south end of Seagull Bar including nearshore sand bars and
• Manitowoc County, lands 500 m (1,640 ft) inland from normal high water line from the southwest property boundary of Point Beach State Forest near Neshotah Park in the City of Twin Rivers (T20N R25E section 31) northwestward along the Lake Michigan shoreline to the south boundary of Section 9, T20N R25E, at Rawley Point.

Piping plovers have returned to Marinette County, Wisconsin ,and a pair have attempted to nest in the designated critical habitat. The current designated critical habitat is presently in public domain and therefore protected.

3.2.2.2 *Mammals*

The gray wolf is a large canid which was federally-listed in 1967. In Wisconsin and Michigan, it is currently listed as endangered. Northern populations have recovered from local extirpation to a point where they now have been proposed for downlisting to threatened (Federal Register 65:135, July 13, 2000). Gray wolves occupy northern forested areas and mainly prey upon white-tailed deer and beaver. Wolves are known to occur within the assessment and restoration areas in Forest, Florence, and Oneida counties in Wisconsin and Menominee, Delta, Alger, Iron, Dickinson and Marquette counties in Michigan.

The Canada lynx, the only lynx in North America, is a rare forest-dwelling cat of northern latitudes. The lynx was federally-listed as threatened in 2000. It feeds primarily on snowshoe hares but also will prey on small mammals and birds. Canada lynx require extensive coniferous forests with downed trees and windfalls that provide cover for denning sites, escape, and protection from severe weather. The Canada lynx historically occurred in the restoration area in Michigan. This species only occasionally occurs in northern forested areas of Wisconsin and has the highest likelihood of being found in Forest, Florence, Oneida, and Marinette counties within the restoration area.

3.2.2.3 *Reptiles*

The eastern massasauga rattlesnake was elevated to federal candidate status in 1999. The massasauga is a small to medium sized poisonous snake that inhabits various wetland types as well as dry, well-drained sandy uplands. It feeds on snakes, frogs, salamanders, toads, small mammals, birds, and young turtles. This snake has been found within the restoration area in Columbia County, Wisconsin.

Designation as a candidate species means that the U.S. Fish and Wildlife Service has determined that the species is warranted for listing as a federally threatened or endangered species, but it has not yet been proposed for listing. Candidate species receive no legal protection, however, the U.S. Fish and Wildlife Service advocates conservation measures for all candidate species, which

may preclude the need for federal listing.

3.2.2.4 *Insects*

The Karner blue butterfly, federally-listed as endangered in 1992, is a small butterfly in the Family Lycaenidae which is dependant upon wild lupine as its exclusive larval food plant. Wild lupine occurs in sandy, open savannahs, barrens and prairies; it is dependent upon open sunny habitats that are maintained by periodic disturbance such as fire. Portions of the restoration area that encompass known habitat for the Karner blue butterfly are found in Adams, Green Lake, Marquette, Portage, Waushara, Menominee, Oconto, Outagamie, and Shawano counties in Wisconsin.

The Hine's emerald dragonfly lives in calcareous (high in calcium carbonate) spring-fed marshes and sedge meadows overlaying dolomite bedrock. This species was listed as endangered in 1995. Habitat loss or degradation is the greatest threat to the Hine's emerald dragonfly. Within the restoration area the dragonfly can only be found in small sites in Door and Kewaunee counties in Wisconsin.

3.2.2.5. *Plants*

The Pitcher's thistle is a native thistle that grows on the beaches and grassland dunes along the shorelines of Lake Michigan, Lake Superior, and Lake Huron. It is most often found in near-shore plant communities but it can grow in all nonforested areas of a dune system. The thistle was federally listed as threatened in 1988 due to dune habitat destruction from shoreline development, road maintenance and construction and shoreline recreational activities. This plant can be found along the shoreline within the restoration area in Door and Manitowoc counties in Wisconsin and Delta County, Michigan.

The dwarf lake iris, a miniature iris with showy, deep blue flowers, was federally listed as threatened in 1988. Occurring close to Great Lakes shorelines in cool, moist lakeshore air, dwarf lake iris is found on sand or in thin soil over limestone-rich gravel or bedrock. This habitat is along old beach ridges or behind open dunes. The threatened plant is found only on the shoreline of Lakes Michigan and Huron. Specifically, the dwarf lake iris is found within the assessment and restoration areas in Door and Brown counties in Wisconsin and Delta and Menominee counties in Michigan.

The eastern prairie fringed orchid is a long-lived perennial plant found in moist to wet tallgrass prairie or wet sedge meadows. The orchid's tuber rootstalk helps it survive grass fires. Fires and rain stimulate the plant to grow and flower. This plant was listed as threatened in 1989. The major factor in the decline of this species has been a loss of habitat due to grazing, fire suppression, and agricultural conversion. The eastern prairie fringed orchid has been documented within the assessment and restoration areas in Winnebago County, Wisconsin.

Fassett's locoweed is a federally-listed threatened plant that is found on gravel and sand lakeshores with partial shade where waves and fluctuating water levels keep shrubs and grasses from crowding out the locoweeds. The seeds of the plant germinate on lakeshores as water levels drop during the summer. The locoweed is found within the restoration area in Portage and Waushara counties in Wisconsin.

3.2.3 Other Fish and Wildlife Species

The area contains diverse aquatic habitats that include riverine, near-shore, and open water habitats. Riverine habitats are found in the Lower Fox River and in tributaries to Green Bay. The warm, shallow waters typical of shorelines and of Lower Green Bay support warm water fish such as bass (Bertrand *et al.*, 1976; Brazner, 1997). Sandbars and estuaries, vital spawning and nursery habitats for many fish species such as yellow perch and northern pike (Brazner, 1997), characterize the western and southern shores of Green Bay, whereas rocky steep shorelines are typical of the eastern shore. Cold, deep waters characterize the open waters of outer Green Bay, generally defined as the section of the bay north of Chambers Island. These waters support cold-water fish such as trout and salmon (Bertrand *et al.*, 1976).

This diversity of habitats supports a diversity of fish species at different trophic levels (University of Wisconsin-Green Bay, 1993). Small forage fish, including alewives, gizzard shad, and spottail shiners, feed on insects, zooplankton, and bottom-dwelling invertebrates and occupy near shore habitats where aquatic vegetation provides cover and forage. These forage fish provide an important trophic link between zooplankton and game fish such as walleye, northern pike, trout and salmon. Bottom feeders such as channel catfish provide another trophic link between bottom-dwelling invertebrates and higher level predators (University of Wisconsin-Green Bay, 1993). Nationally important fish stocks of the area, as classified by the Great Lakes Fish and Wildlife Restoration Act (16 U.S.C. 941), include lake trout, yellow perch, lake sturgeon, and walleye (U.S. FWS and Stratus Consulting, 1999a).

The fishery resource, one of the most productive in the Great Lakes, is of central importance to the Green Bay food web because it provides food for the region's many piscivorous (i.e., fisheating) birds and mammals (U.S. EPA and Environment Canada, 1995). Birds and mammals that depend on the fishery resource for food include bald eagles, terns, herons, ducks, double-crested cormorants, otter, and mink (Linscombe *et al.*, 1982; Toweill and Tabor, 1982; Allen *et al.*, 1987).

Situated on one of the major bird migration routes in North America, the Mississippi Flyway, the Lower Fox River and Green Bay environment provides essential habitat for large populations of breeding and migratory birds (Temple and Cary, 1987; Erdman and Jacobs, 1991; Robbins, 1991; U.S. FWS and Stratus Consulting, 1999c). More than 250 bird species have been recorded in the five Wisconsin counties immediately adjacent to the bay and river (Temple and Cary, 1987), and 91 bird species have been recorded in the townships adjacent to the Michigan Green Bay shore (Brewer *et al.*, 1991). At least 16 species listed by either the State of Wisconsin, the State of

Michigan, or the federal government as threatened or endangered are found in the restoration area, including bald eagle, peregrine falcon, great egret, and Caspian and Forster's terns (U.S. FWS and Stratus Consulting, 1999c).

The diversity of mammals found in the restoration area is as varied as the habitats of northeastern Wisconsin. Dominant mammals in agricultural areas include white-tailed deer, rabbits, red fox, coyote, ground squirrels and bats. Forests (deciduous and coniferous) were expansive throughout the area historically but development, urban expansion, and agriculture have decreased this type of habitat. Species using the forested land include the white-tailed deer, skunk, raccoon, northern flying squirrel, woodland deer mouse and jumping mouse (Jackson, 1961). Many types of wetlands occur in the restoration area, marsh, coastal and riverine to name a few. Mammals common to these wet areas include mink, muskrat, otter, raccoon, bats, star nosed moles and shrews (Jackson, 1961, WDNR, 2001a).

3.3 Land Use

The main historical and current types of land use in the assessment area are agricultural, recreational, logging, and industrial/residential (largely confined to areas along the Lower Fox River). Farming or agriculture is the dominant land use found in the area, including cropland, orchards, pastures, and meadows for grazing. Forests in the area are utilized for recreation and logging.

3.4 Cultural Resources

People have occupied the Upper Midwest since the last glaciers moved farther north approximately 11,000 years ago. The record of these people exists only in prehistoric archeological sites that today are hardly visible on the landscape.

Prior to European settlers, the Native peoples depended upon the Bay and River for food, transportation and clothing. Because many cultural events were associated with hunting, fishing, and harvesting of plants from the River and Bay, the waters have a distinctive place in Indian culture. During the early historic period, Native American tribes in the Upper Midwest were in great turmoil and most, if not all, tribes left their ancestral lands. Either voluntarily or through coercion from the Federal government, these tribes consolidated, split apart, disappeared, or generally resettled west and south of their ancestral homelands. Furthermore, archeologists have seldom been able to connect through the archeological data prehistoric cultures with modern tribes. Nevertheless, some tribes make aboriginal claims to lands and some tribes retain traditional cultural practices and concern for human remains and scared sites on lands they no longer occupy.

French, Spanish, and English people began exploring the Upper Midwest in the early 17th century. Following the explorers, trappers moved into the area and established relationships with Native Americans and constructed trading posts. Governments laying claim to the area often

established military posts and forts. Miners and loggers moved into the upper Midwest about the same time and in some cases continued to operate into the 20th century. Euro-American farmers settled the area in the early 19th century and established towns, transportation systems, and small industries. The record of these people exists in many forms including historic archeological sites, buildings, and structures which may or may not be visible on the modern landscape. As of July 1, 2002, every county listed in this environmental assessment has at least one property listed on the National Register of Historic Places and all counties together have 276 properties listed.

The avian and fishery resources of the Lower Fox River and Green Bay ecosystem are vital food sources and are of great cultural significance to the Oneida and Menominee nations (U.S. FWS and Stratus Consulting, 1999a, 1999c). After the Oneida people were relocated from New York to the reservation near the City of Green Bay, they obtained most of their meat from local game, including waterfowl, turkey, and other small game. In addition, the local birds, including the bald eagle, play an important spiritual role in the lives of the Oneida and Menominee people (U.S. FWS and Stratus Consulting, 1999c). The fishery resource is also an integral part of the Oneida and Menominee tribal cultures. For the Oneida people, the annual fish migrations were historically a focus for cultural events and community gatherings. (U.S. FWS and Stratus Consulting, 1999a). Similarly, the lake sturgeon was historically an important source of food for the Menominee people, and it is a spiritual being in the creation of the Menominee and remains a strong cultural and spiritual symbol (Beck, 1995, D. Cox and R. Wilson, Menominee Indian Tribe, personal communication, October 2000).

3.5 Local Socioeconomic Conditions

From Lake Winnebago to the mouth of the river, the Lower Fox River valley supports a population of approximately 412,900 people. This is the second largest urbanized area of Wisconsin. There are 20 paper mills along the 39 miles of the Fox River employing approximately 26,000 people in the valley. While papermaking is a major employer, other industries important to the local economy include metal working, printing, food, textiles, wood products, chemicals and agriculture. Counties surrounding the bay of Green Bay have a population of approximately 119,100 in Wisconsin and 63,000 in Michigan. These counties are sparsely populated and the major industry is agriculture. Tourism is also important to the area. State and county parks and forests are found throughout the area along with many opportunities for sport fishing on the bay and in Lake Michigan. Door County is a major destination for travelers throughout the Midwest and is nationally recognized as a premier vacation area (Willman and Toneys, 2001).

CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

4.1 Environmental Consequences Common to All Alternatives

4.1.1 Listed, Proposed, and Candidate Species

The Canada lynx and Kirtland's warbler would be neither negatively nor positively affected by any of the alternatives. Canada lynx only occasionally occur in northern forested areas of Wisconsin and require older, mature forests as habitat. These types of lands are not a part of the Co-trustees' restoration strategy to restore, rehabilitate, replace and/or acquire the equivalent of natural resources injured by the release of PCBs into the environment. The Kirtland's warbler also requires a very specific habitat, large stands of young jack pines, that is not part of the restoration strategy outlined in the alternatives. These types of habitats will not be preserved, restored or enhanced within any of the alternatives. These two species were not harmed by the release of PCBs into the environment, nor are they the equivalent of those injured and therefore are not subject to any priority for restoration.

4.2 Alternative A: No Action

4.2.1 Habitat Impacts

Under this alternative, no habitat would be preserved, restored or enhanced beyond what the Co-trustees are currently doing within mandates, policies and restricted budgets. Existing environmental degradation not directly related to PCB releases would continue to occur, and perhaps worsen under the No Action alternative, such as the loss of habitat due to development pressure along the coast of Green Bay. The public would not be compensated for injuries to natural resources from the release of PCBs into the environment.

4.2.2 Biological Impacts

Fish and wildlife harmed by the release of PCBs into the environment would not be restored, rehabilitated, replaced or the equivalent acquired if this alternative were chosen. Since there would not be a net gain of habitat, particularly wetlands needed for fish spawning and nurseries, populations of fish species needing this type of habitat would not increase so the diversity of the fishery would remain unbalanced. Wildlife species dependent on water and habitats including the water-upland interface such as waterfowl, colonial waterbirds, mink, muskrat and otter may also be further harmed due to continued degradation or destruction of existing habitat.

4.2.3 Listed, Proposed, and Candidate Species

Negative impacts to listed species, other than the Canada lynx and Kirtland's warbler, may continue under this alternative since unknown numbers of resources that would be protected by

Alternatives B and C would remain in private domain, where they are more likely to be negatively impacted.

4.2.4 Cultural Resources

If the No Action alternative were selected, cultural resources identified by the Oneida and Menominee Indian Tribes would not be restored or replaced. Impacted cultural resources include revered species, such as the bald eagle, sturgeon, and turtle species, all of which play prominent roles in ceremonies and creation stories, as well as sacred locations, such as traditional gathering places along Green Bay, Duck Creek and the Wolf River. This alternative would not preserve any archeological and historic resources since there would be no acquisitions. Adverse impacts may continue under this alternative since unknown numbers of resources that would be protected by Alternatives B and C would remain in private domain, where they are more likely to be negatively impacted.

4.2.5 Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (59 Federal Register 7629(1994)), directs federal agencies to incorporate environmental justice in their decision making process. Federal agencies are directed to identify and address as appropriate, any disproportionately high and adverse environmental effects of their programs, policies and activities on minority or low-income populations.

Under the No Action alternative recreational opportunities would not be increased through land acquisition, resource restoration or enhancement projects. Low income populations would not gain increased public land for fishing, hunting, gathering, hiking and wildlife viewing and would not have improved public facilities to use. While the more affluent can afford travel and pay for alternatives, the target populations are less capable of doing so.

4.2.6 Socioeconomic Impacts

If the No Action alternative were implemented there would be no positive indirect economic impacts on the local economy because there would not be additional lands that could provide increased recreational activities in the area. Since natural resources would not be restored, rehabilitated, replaced or the equivalent acquired under this alternative, the environment would continue to be developed and people may decide to vacation and recreate outside of the restoration area. Businesses and homeowners may also choose to locate away from the degraded environment, which would negatively impact the area economically.

4.2.7 Cumulative Impacts

Cumulative impacts would be adverse to the environment if this alternative were chosen. The coastal shoreline of Green Bay is quickly being developed due to the increased growth of the municipalities near the Bay with bay front property highly desired. Despite the existence of laws and regulations designed to minimize wetland losses and impacts, threats to wetlands from indirect impacts, cumulative small scale impacts, or surrounding land use changes still exist. Furthermore, exclusive reliance on regulations and policies do not necessarily provide for long-term preservation of valuable wetland and upland habitats. This continued loss of habitat could be detrimental to the populations of migratory birds that use the area for a migratory resting grounds and nesting area for those species that remain for the nesting season. There would be fewer areas for birds to rest without disturbance, find food or raise young to add to the regional population. Green Bay and its tributaries are a large part of the Lake Michigan ecosystem. The loss and degradation of coastal and riparian wetlands would also contribute to the continued instability of the fish community in Green Bay and Lake Michigan. Also, no fishery resource enhancement projects would be implemented under the No Action alternative, thus further impacting the Lake Michigan fishery as a whole.

4.3 Effects Common to Alternative B and Alternative C

4.3.1 Habitat Impacts

Wetlands and upland habitats associated with those wetlands provide essential ecological functions for fish such as walleye and pike, waterfowl, herons, mink, raccoons and many other fish and wildlife species, thus preserving, restoring or enhancing wetlands serves to compensate for losses caused by PCBs by providing an effective means of improving the ecological functions of the Lower Fox River and Green Bay. In addition, wetland restoration and preservation also improves public use and enjoyment of these resources. Benefits of aquatic habitat improvements or enhancements would include improved water quality, restored habitat for fish and wildlife species, and increased ecological productivity. Improving the quality of aquatic vegetation and habitat for fish and some birds would provide similar, though not the same ecological functions, as those injured by PCBs.

Under Alternatives B and C there would be minimal short-term impacts to habitat due to the needed manipulation of soil to complete wetland and aquatic habitat restoration or enhancement projects. There would be permanent impacts due to the destruction of habitat for trails, boat ramps, fishing piers and parking areas associated with public use. However, these same projects would also protect and improve the quality of natural resources by directing and controlling human impacts on those resources in the area.

4.3.2 Biological Impacts

The action alternatives would benefit many different species of fish and wildlife found in the Lower Fox River and Green Bay. Preservation, reestablishment and enhancement of wetland, associated upland and aquatic habitats would benefit waterfowl, rails, terns, songbirds, osprey, mink, beaver, northern pike, walleye and sturgeon, to name a few. Fishery resource enhancement projects would directly benefit species such as the spotted muskellunge and yellow perch and the development of a balanced, healthy fish community. Through the aquatic habitat quality improvement projects there would be an increase in shallow waters and beds of submergent and emergent vegetation providing habitat for migrating waterfowl, feeding areas for shorebirds, waterbirds and many species of fish found in Green Bay and its tributaries. There would be minimal negative impacts to biological resources from human disturbance in relation to use of preserved areas and natural resource-based public use projects. The public use projects would also protect and potentially minimize human disturbance to fish and wildlife by controlling human impacts on those resources.

4.3.3 Listed, Proposed, and Candidate Species

Federally-listed threatened or endangered species would receive further protection and aid in the recovery of the species if either of these alternatives were implemented. However, due to the extended area for restoration, Alternative C would provide greater benefits to the recovery of threatened, endangered or candidate species. Wetland, associated upland and aquatic habitat preservation would most likely benefit the bald eagle, piping plover, Hine's emerald dragonfly, dwarf lake iris, Pitcher's thistle, Fassett's locoweed, eastern prairie fringed orchid and the eastern massasauga rattlesnake. The action alternatives may provide limited benefits to the gray wolf and Karner blue butterfly due to the type of habitats required by these species.

Protective measures would be taken as provided in Appendix C during implementation of any projects. Adherence to the restrictions should provide for no adverse effects on the listed species.

4.3.3.1 *Birds*

Bald eagle nesting and wintering habitats, and prey species (mainly fish) would be protected, reestablished or enhanced through the action alternatives, thus the eagle would benefit from these alternatives. In addition, lands placed in public domain would be more likely to confine public use to certain areas, which would benefit eagles.

The Kirtland's warbler would not benefit from any of the Alternatives because the specific habitat required by the species is not a part of the restoration strategy of the Co-trustees. This species was not injured by the release of the PCBs into the environment nor are they an equivalent of those injured.

Alternatives B and C include the protection of coastal and riverine wetlands along with habitat

associated with islands; these areas could potentially include beaches needed by the piping plover for nesting habitat. The piping plover would benefit from the action alternatives if this type of habitat is acquired and protected from human disturbance during critical nesting periods.

4.3.3.2 *Mammals*

There is the potential that gray wolves may use lands acquired under Alternatives B and C.

The Canada lynx would not benefit from any of the Alternatives because the specific habitat required by the species is not a part of the restoration strategy of the Co-trustees. This species was not injured by the release of the PCBs into the environment nor are they an equivalent of those injured.

4.3.3.3 *Reptiles*

Only a small portion of Columbia County, Wisconsin, lies within the restoration area outlined under Alternative C. If Alternative B is chosen, the eastern massasauga rattlesnake would not benefit. However, under Alternative C, there is the potential that habitat used by the rattlesnake would be preserved and/or restored.

4.3.3.4 *Insects*

Portions of the historic range of the Karner blue butterfly lie within both the assessment area and restoration area outlined in Alternatives B and C, respectively. Properties acquired that contain sandy soils or habitat reestablished or enhanced along the tributaries of the Lower Fox River could potentially benefit this species.

Since Door County, Wisconsin, lies within both the assessment area and restoration area outlined in the action alternatives, restoration projects that would protect, reestablish, or enhance the wetlands meeting the requirements for the Hine's emerald dragonfly would benefit this species.

4.3.3.5 *Plants*

Delta County, Michigan, and Door County, Wisconsin, lie within both the assessment area and restoration area outlined in Alternatives B and C, respectively. Therefore, restoration projects that would protect, reestablish, or enhance the habitat for Pitcher's thistle would benefit this species. However, the thistle is also known to occur in Manitowoc County, Wisconsin, which lies within the restoration area but not the assessment area, and therefore Alternative C would potentially benefit the plant greater than Alternative B.

Lands acquired in Door and Brown counties in Wisconsin and Delta and Menominee counties in Michigan that include old beach ridges and open dunes would benefit the dwarf lake iris. Brown County, Wisconsin, located in the southern portion of Green Bay, is a high priority area for the

Co-trustees and the potential to benefit this species is high.

Lands or easements on lands acquired would be actively managed for the fish, wildlife and plant species located in the area. The eastern prairie fringed orchid would benefit from the active management, which may include controlled burns and reestablishment or enhancement of the habitat.

Portage and Waushara counties in Wisconsin lie only within the restoration area outlined in Alternative C. If Alternative B is chosen, the Fassett's locoweed would not benefit. However, under Alternative C, restoration projects that would protect, reestablish, or enhance the habitat for Fassett's locoweed would benefit this species.

4.3.4 Cultural Resources

These two alternatives would potentially preserve any archeological and historic resources if acquired and would restore or preserve specific areas or resources that have appreciable cultural value to the Indian tribes of the area. Aquatic habitat restoration or enhancement would improve the condition of species such as lake sturgeon, which have cultural and religious importance for local tribes.

4.3.5 Environmental Justice

Wetland and upland preservation would involve transactions with willing landowners. No minority or low-income populations would be displaced or negatively affected in any way. The purchase of habitat would bring additional lands into the public domain. While the primary purpose of the preservation of this land is for fish and wildlife, portions of the acquired properties may be used by the public for natural resource based recreational activities such as wildlife viewing, hiking, fishing or hunting. Populations near the purchased lands would benefit from these increases in available public land. It is expected that improving existing public natural resource recreation facilities would also enhance recreational opportunities for minority and low-income populations. Aquatic habitat improvement would also enhance recreational opportunities in and around the Lower Fox River and Green Bay.

4.3.6 Socioeconomic Impacts

Since wetland and upland preservation would involve transactions with willing sellers who would be paid fair market value, acquisition procedures would have little or no impact on the market price, or on landowners in the area who choose not to sell. Since wetland and ecologically associated uplands targeted for preservation are currently undeveloped, preservation in their current state would have minimal effects on the local economy and tax base. Payment in lieu of taxes would maintain the local tax base if land is acquired by the State of Wisconsin, State of Michigan, Oneida Tribe of Indians of Wisconsin, the Menominee Indian Tribe of Wisconsin or the U.S. Fish and Wildlife Service. In Michigan, any lands deeded to local units of

government are exempt from contributing property taxes. The Co-trustees are currently not considering deeding any lands to local governments in the State of Michigan; the land would be owned and managed by the Michigan Department of Natural Resources, the federal government, land trusts or conservation non-government organizations. If this consideration is changed in the future and land is deeded to local entities in Michigan, a supplemental document evaluating any impacts would be published.

There would be indirect positive economic impacts on the local economy through the many recreational activities that the protected wetlands and uplands would enhance. These activities include hunting, fishing, wildlife viewing, cross-country skiing and photography. Aquatic habitat improvements or enhancements would provide for more opportunities for public use and enjoyment of natural resources. Improving natural resource recreation facilities would increase the use of these areas, bringing increased business to the surrounding communities.

4.4 Alternative B: Natural Resource-Based Restoration Within the Assessment Area

4.4.1 Element Common to All Impacts

The limitation of Alternative B for all elements analyzed is that the restoration project implementation area only includes the assessment area. Projects that restore, rehabilitate, replace and/or acquire the equivalent would only be completed within the area of assessment. Other stressors in the ecosystem such as excess sediment and nutrient loading from upland storm water runoff would continue to negatively affect the assessment area where restoration projects would be implemented. These stressors may also inhibit the ability of the natural resources to recover fully or negatively impact other restoration projects undertaken by the Co-trustees.

4.4.2 Cumulative Impacts

Cumulative impacts from habitat acquisition, restoration or enhancement implemented under Alternative B would positively affect the region as a whole. Historically, approximately 60 percent of the wetlands of Green Bay as a whole have been permanently altered with 90 percent of wetlands filled or altered downstream from the De Pere dam on the Lower Fox River and the southern portion of the bay (UWGB, 1993). Statistics on aquatic habitat loss in the bay and tributaries are not to be found due to limited information of distribution and abundance of such habitat. Valuable habitat, wetland and aquatic, is currently being lost piece by piece due to continued degradation (*ie.* erosion, sedimentation and nutrient loading) and destruction (*ie.* urban development). The regulatory system now in place requiring authorization from the Army Corps of Engineers (Sections 10 and 404) and water quality certification and water quality standards compliance from the Wisconsin Department of Natural Resources (NR229 and NR103) serve as deterrents to wetland and water quality impacts. Despite the existence of laws and regulations designed to minimize wetland and aquatic habitat losses and impacts, threats to wetlands and aquatic habitat from indirect impacts, cumulative small scale impacts, or surrounding land use changes still exist. Municipal and industrial waste discharges have been greatly reduced over the

last few decades (1970s-1990s) (UWGB, 1993), however runoff from the surrounding land continues to move nutrients and soils into the waters of the Lower Fox River and Green Bay causing degradation of water and aquatic habitat quality. There are federal and state programs that are currently contributing to improving the overall health of the ecosystem and improving resources in each of the watersheds associated with the assessment area, including but not limited to the U.S. Department of Agriculture's Conservation Reserve Program, Conservation Reserve Enhancement Program, and Wetland Reserve Program, the Department of the Interior's Land and Water Conservation Fund Grants, the U.S. Fish and Wildlife Service's Partners for Fish and Wildlife Program and National Coastal Wetlands Conservation Grants. The states implement various programs with funds obtained from the U.S. Environmental Protection Agency such as Section 319 Clean Water Act Nonpoint Source State Grants, Section 106 CWA Water Pollution Control Program Grants and Sec. 104(b)(3) Wetlands Program Development Grants, to name a few. Alternative B includes provisions for partnering with these programs and others as well as independent projects. With the implementation of projects, more habitats would be protected and fish and wildlife populations would increase. Migratory birds would have more undisturbed areas for spring and fall migration resting and feeding stopovers and there would be more habitats for those species that nest in this area, thus, further contributing to the overall population of bird species in the region and flyway. Fish spawning and nursery habitats would also increase, contributing to the stability of the fish community in Green Bay and Lake Michigan.

Fishery resource enhancement projects under this Alternative would contribute to the continued management to stabilize the fish community, which would add to the fishery of Lake Michigan. Green Bay was historically one of the most important fishing areas of Lake Michigan (Bertrand *et al.*, 1976). The Bay is relatively shallow and nutrient rich with extensive coastal wetlands providing for spawning and nursery habitat including the walleye and yellow perch. There are also deeper waters in the Bay that attract cold water fish such as whitefish and trout. Fishery resource enhancement projects outlined in Alternative B would contribute to the continued cooperative management of state and federal agencies (*e.g.*, Strategic Plan for Management of Great Lakes Fishery (Great Lakes Fishery Commission, 1994), Lake Michigan Integrated Fisheries Management Plan (WDNR, 1995), A Fisheries, Wildlife and Habitat Management Plan for Wisconsin (WDNR, 2000)) to balance the fish community, which would assist in the enhancement of Lake Michigan and the Great Lakes as a whole.

There are approximately 126 city, county and state park facilities within the area with a total of approximately $9.4 million spent annually to operate the parks (Stratus Consulting, Inc., 2000). The majority of the funds are used in operations and little are left to improve or update facilities such as boat ramps and docks or fishing piers. Improvements provided by natural resource-based public use enhancement projects directed toward these facilities would provide public use and enjoyment functions related to aquatic habitats that are similar to, though not the same as those impaired by the presence of PCBs in and around the Lower Fox River and Green Bay. The natural resource-based public use enhancement projects would direct high intensity public use activities away from ecologically sensitive areas and thereby protect or preserve the ecological integrity of a site, thus more habitat is protected for fish and wildlife.

One substantive limiting factor of Alternative B is that efforts taken for restoration would be narrowly focused and ecosystem functions would be less likely to be either restored or compensated for since the entire ecosystem is not considered for restoration purposes.

4.5 Alternative C: Natural Resource-Based Restoration Within and Beyond the Assessment Area (Proposed Action)

4.5.1 Element Common to All Impacts

Alternative C includes the extension of the project area of implementation up to the headwaters of tributaries of the Lower Fox River and Green Bay and adjacent watersheds. Land acquired in the restoration area would include properties that currently deliver (or can deliver through restoration or enhancement) ecological services that may never be replaced within the assessment area or take a long time to recover. Restoration or enhancement projects in the restoration area would enhance recovery time and reduce the compensable damages to the public. By extending the assessment area to the restoration area the opportunity to replace (substitute) natural resources or services for those injured away from the contaminated site is possible. Under this alternative the ecosystem can be looked at as a whole regarding restoration. Stressors upstream can be addressed through projects, therefore, restoration projects downstream would have greater success.

4.5.2 Cumulative Impacts

Numerous resource management plans, partnership groups, and local planning groups (see Section 4.4.2 and 6.3) are contributing to improving the overall health of the ecosystem and improving resources in each of the watersheds associated with the assessment area. Alternative C would contribute to the effort of the region. Habitat (aquatic, wetland and ecologically associated upland) acquisition, restoration or enhancement, and fishery resource enhancement projects would positively affect the region as a whole in conjunction with other programs as outlined under Alternative B cumulative impacts (section 4.4.2). Alternative C would provide for opportunities to add to the habitats currently under protection, connect habitats currently protected, develop large tracts of continuous valuable habitat that would benefit fish and wildlife species in the area, and benefit the development of the stabilization of fish communities.

To begin restoring the overall ecology of the Lower Fox River and Green Bay and achieve maximum benefit from those restoration projects implemented, the ***complete*** watershed, including headwaters and subbasins, needs to be addressed. Alternative C provides for restoration projects to be implemented within the entire watershed.

4.6 Summary of Environmental Consequences by Alternative

Attributes	**Alternative A** (No Action)	**Alternative B** (Natural Resource-Based Restoration Within the Assessment Area)	**Alternative C** (Natural Resource-Based Restoration Within and Beyond the Assessment Area (Proposed Action))
Wetlands	expected continued net loss of habitat	increase of wetland habitat, but may continue to be degraded from upstream sediment and nutrients	increase of wetland habitat, ability to deal with upstream sediment and nutrient issues
Uplands associated with wetlands	continued loss of habitat	increase of upland habitat associated with wetlands	increase of upland habitat associated with wetlands
Aquatic habitat	continued degradation and loss of habitat	increase of aquatic habitat, but may continue to be degraded from upstream sediment and nutrients	increase of aquatic habitat, ability to deal with upstream sediment and nutrient issues
Fish resources	populations would remain unbalanced for a greater length of time	increase in diversity of fish community and populations, may be limited due to habitat degradation from upstream sediments and nutrients	increase in diversity of fish community and populations
Wildlife resources	continued harm and decrease of numbers	increase in populations, may be limited due to habitat degradation from upstream sediments and nutrients	increase in populations
Threatened or endangered species	negative impacts would continue	provide for further recovery of species in the area	provide for further recovery of more species in the area than Alternative B due to the extended restoration area
Cultural resources	adverse impacts would continue	preserve important sites and resources; increase populations of fish and wildlife important to the tribes of the area such as the bald eagle and sturgeon, may be limited due to habitat degradation from upstream sediments and nutrients	preserve important sites and resources; increase populations of fish and wildlife important to the tribes of the area such as the bald eagle and sturgeon
Surface water	remain degraded due to sediment and nutrient loading	increase in surface water quality	surface water quality would be improved over Alternative B and greatly improved over Alternative A
Environmental justice issues	no increase of recreational opportunities	increase in recreational opportunities	increase in recreational opportunities
Socioeconomic issues	local economy would remain the same or decrease due to continued injury without restoration	increase in local economy due to increased recreational opportunities and green areas to build near; in Michigan and Wisconsin the tax base would remain the same	increase in local economy due to increased recreational opportunities and green areas to build near; in Michigan and Wisconsin the tax base would remain the same
Recreational use	no enhancement or increase of recreational facilities and opportunities	enhancement or potential increase of recreational facilities and opportunities	enhancement or potential increase of recreational facilities and opportunities
Cumulative impacts	potential decrease in populations of migratory birds, continued degraded fishery in Lake Michigan, and continued loss of wetland habitat in the Great Lakes region	increased populations of migratory birds and greater diversity in the fish community for Lake Michigan; ecosystem functions are less likely to be restored or compensated for since entire ecosystem would not be considered for restoration purposes	increased populations of migratory birds and greater diversity in the fish community for Lake Michigan; restoration efforts not narrowly focused geographically therefore ecosystem functions are able to be restored

CHAPTER 5

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CHAPTER 6
CONSULTATION AND COORDINATION WITH THE PUBLIC AND OTHERS

6.1 National Historic Preservation Act Compliance

The U.S. Fish and Wildlife Service's Region 3 Regional Director will provide the State Historic Preservation Officers and Tribal Historic Preservation Officers with this restoration plan and environmental assessment as part of the public review and comment process, drawing their attention to the recommended procedure for implementing Section 106 of the National Historic Preservation Act as described in 36 Code of Federal Regulations (CFR) Part 800.

6.2 Endangered Species Act Compliance

The U.S. Fish and Wildlife Service's Restoration Coordinator for the Lower Fox River and Green Bay Natural Resources Damage Assessment and Restoration will provide the U.S. Fish and Wildlife Service's Ecological Services Field Office this restoration plan and environmental evaluation to comply with the consultation process pursuant to Section 7 of the Endangered Species Act (ESA) of 1973, as amended, 16 USC § 1531, *et seq.*, and its implementing regulation (50 CFR Part 402). Appendix C includes the Intra-Service Section 7 Biological Evaluation Form, avoidance measures and letter to initiate the Section 7 consultation process.

6.3 Public Meetings, Presentations and Scoping for Restoration

February 23, 2000, Presentation of the restoration planning process to The Nature Conservancy of Door County, Sturgeon Bay, Wisconsin.

February 24, 2000, Presentation of the restoration planning process to the Clean Water Action Council Board, Green Bay, Wisconsin.

March 13, 2000, Presentation of the restoration planning process to the Brown County Conservation Alliance, Green Bay, Wisconsin.

March 14, 2000, Presentation of the restoration planning process to the Green Bay Remedial Action Plan, Science and Technical Advisory Committee, Green Bay, Wisconsin.

April 7, 2000, Presentation of restoration planning details to the Green Bay Remedial Action Plan, Science and Technical Advisory Committee, Green Bay, Wisconsin.

April 11-14, 2000, Participation in Door County habitat prioritization discussions with Door County constituents, Baileys Harbor, Wisconsin, hosted by The Nature Conservancy.

May 4, 2000, Participation in Northeast Wisconsin land protection prioritization discussions with Northeast Wisconsin constituents, Menasha, Wisconsin, hosted by the Northeast Wisconsin Land Trust.

June 2, 2000, Presentation of initial wetland restoration analyses and approaches to the Green Bay Remedial Action Plan, Science and Technical Advisory Committee, Green Bay, WI.

July 7, 2000, Presentation of initial nonpoint source restoration analyses and approaches to the Green Bay Remedial Action Plan, Science and Technical Advisory Committee, Green Bay, WI.

August 4, 2000, Presentation of draft restoration results and identification of issues to the Green Bay Remedial Action Plan, Science and Technical Advisory Committee, Green Bay, WI.

August 31, 2000, Discussion with Northeast Wisconsin Land Trust Board members of potential restoration programs in Northeast Wisconsin which could result from natural resource damages settlements.

September 14, 2000, Presentation of draft wetlands and nonpoint source reports to the Green Bay Remedial Action Plan, Science and Technical Advisory Committee, Green Bay, WI.

October, 2000, 45-day public comment period for review of the final Restoration and Compensation Determination Plan.

October 25, 2000, Public Hearing on Restoration and Compensation Determination Plan (RCDP), Brown County Library, Green Bay, Wisconsin

November 27, 2000, Public Hearing on RCDP, Winnebago County Courthouse, Oshkosh, Wisconsin

November 30, 2000, Public Hearing on RCDP, Door County Courthouse, Sturgeon Bay, Wisconsin

December 6, 2000, Public Hearing on RCDP, Civic Center, Escanaba, Michigan

December 7, 2000, Public Hearing on RCDP, Fox Valley Technical College, Appleton, Wisconsin

Scientific-based public attitude surveys regarding natural resource injuries and restoration:

> Hutchison, R. 1997. Subsistence Fishing Impacts of PCB Advisories in the Lower Fox River. Prepared for Hagler Bailly Consulting Company and U.S. Fish and Wildlife Service. October.
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> Stratus Consulting, Inc. 2000. Restoration Scaling Based on Total Value Equivalency: Green Bay Natural Resource Damage Assessment. Prepared for U.S. Fish and Wildlife Service, U.S. Department of the Interior, and U.S. Department of Justice. October.
>
> Desvousges, W.H., D.J. MacNair, and G.A. Smith. 2000. Lower Fox River and Bay of Green Bay: Assessment of Potential Recreational Fishing Losses and Restoration Offsets.

Prepared for Fort James Corporation. November.

An extensive amount of resource-based restoration planning has already been conducted for the Lower Fox River and Green Bay area by a variety of government agencies such as: Lower Fox River Basin Integrated Management Plan (WDNR, 2001a), The State of the Lakeshore Basin (WDNR, 2001b), The Upper Green Bay Basin Integrated Management Plan (WDNR, 2001c), Winnebago Comprehensive Management Plan (WDNR, 1989), Lower Green Bay Remedial Action Plan for the Lower Fox River and Lower Green Bay Area of Concern (WDNR, 1988), Green Bay National Wildlife Refuge Preliminary Project Proposal (USFWS, 1996), Hine's Emerald Dragonfly (*Somatochlora hineana*) Recovery Plan (USFWS, 2001), a recovery plan is currently being developed for the Great Lakes population of the piping plover, North American Waterfowl Management Plan, Joint Strategic Plan for the Management of Great Lakes Fisheries (Great Lakes Fishery Commission, 1994), the Menominee Indian Tribe of Wisconsin's Menominee Lake Sturgeon Management Plan, the Circle of Flight Waterfowl Projects and the Wild Rice Restoration Projects, as well as plans developed by local municipalities and private organizations. These planning efforts promote the same types of restoration projects that constitute the Co-trustees proposed alternative. Many of the projects outlined in the various plans were proposed by public interest groups or local governments.

6.4 Restoration Project Proposal Process

Restoration projects will be selected and implemented through a cooperative process between the Co-trustees and partners. The Co-trustees each have established work planning and project identification processes for their base work efforts. In order to maximize the ecological benefit of the damage settlement resources, it is the intent of the Co-trustees to utilize these ongoing processes to identify projects for implementation. The Co-trustees will work with partners and amongst themselves to identify projects which meet the restoration criteria and goals contained within this Restoration Plan. The Trustee Council will review and make the final decisions on the selection of projects which are recommended by the Co-trustee organizations. Appendix D contains restoration project proposal format and guidance.

Potential cooperators include municipalities within the restoration area, county and local governments, State and Federal government programs, Tribal governments, and private nonprofit organizations interested in fish, wildlife, wetland or aquatic habitat quality enhancing projects. Restoration project proposals prepared by cooperators are more likely to be supported by the community because they will better reflect local interests, priorities, and tolerances. Overall effectiveness of the Lower Fox River and Green Bay restoration plan will increase through matching public and private contributions (dollars and services) and coordination with other area enhancement projects.

Restoration projects will be developed and implemented through cooperative efforts between the Co-trustees and interested partners. It is expected that partners will include interested state and federal agencies, local and tribal governments, consulting firms, nonprofit organizations, and other appropriate entities. Partners will work through existing resource managers and resource programs to develop restoration projects. Restoration projects should not duplicate or substitute for traditional funding sources or program responsibilities. Basic principles of fish and wildlife biology, landscape ecology, botany, wetland/riverine ecology, and hydrology are important concepts to utilize in the development of quality restoration projects that restore both habitat

structure and function and comply with the criteria identified in this plan. Cooperative projects will be encouraged.

By law, the trustees are responsible to the public for the damages being disbursed to restore resources injured by the release of hazardous substances. The trustees must restore, rehabilitate, replace and/or acquire the equivalent resources to those injured. Therefore, the Co-trustees must maintain the linkage between injury and restoration and are accountable to the public for the funds, including National Environmental Policy Act (NEPA)[42 U.S.C.§ 4321] compliance and restoration planning requirements under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)[42 U.S.C. § 9607]. There is no intent by the Co-trustees to delegate these trust responsibilities to other parties or organizations. Any trust or foundation that would potentially be proposed to hold or assist in the management of settlement funds would have to allow the Co-trustees to be the decision makers on the allocation of the funds.

6.4.1 Restoration Project Proposal Acceptability Criteria

Proposed projects will be screened against the acceptability criteria (Table 6.1) to be considered further in the restoration planning process. These criteria, which were published in the iRCDP (U.S. FWS and Hagler Bailly 1998b), were developed by the Co-trustees to aid in eliminating those projects that are clearly inconsistent with the requirements of the Department's NRDA regulations. In essence, the acceptability criteria stipulate that a restoration project must comply with all applicable laws and regulations, address resources or services at least broadly connected to those injured by PCBs, and be technically feasible to implement. Proposed projects will be ranked on a pass/fail system in relation to each criterion. If a proposed project passes each criteria, it will be evaluated further. If a proposed project fails any of the acceptability criteria, it will no longer be considered.

Table 6.1
Acceptability Criteria for Restoration Planning
(projects are evaluated using acceptability criteria on a pass/fail basis)

Criteria	Interpretation
Complies with applicable/relevant laws, policies and regulations.	Project must be legal, and protect public health, safety.
Addresses Lower Fox River and Green Bay ecosystem injured natural resource(s).	Projects must restore, rehabilitate, replace or acquire the equivalent of natural resources injured by PCBs in the Lower Fox River and Green Bay ecosystem.
Is technically feasible.	Projects must be feasible within the proposed budget.

6.4.2 Restoration Project Proposal Ranking Criteria

The Co-trustees developed criteria to evaluate and rank potential restoration projects and published the criteria in the iRCDP (U.S. FWS and Hagler Bailly 1998b). The criteria were grouped into three categories that reflect the aspects of the projects that the criteria evaluate: "focus" criteria, which evaluate project objectives (Table 6.2); "implementation" criteria, which evaluate project methods (Table 6.3); and "benefits" criteria, which evaluate the types and

characteristics of the benefits the projects aim to achieve (Table 6.4). These criteria reflect the Co-trustee requirements and priorities for NRDA restoration as outlined in the proposed alternative. The purpose of the criteria is to provide a means of ranking potential restoration projects against each other by considering the objectives and requirements of the NRDA restoration planning process. Proposed projects will then be rated by priority within each criterion. Projects with the highest ranking will proceed for final review and selection for implementation by the Co-trustees. If no acceptable proposals are received, modifications or additional proposals will be requested.

6.4.2.1 *Restoration Project Focus Criteria*

These evaluation criteria relate to whether the project meets the goals and objectives of the Co-trustees for restoration of the Lower Fox River and Green Bay environment.

Table 6.2
Focus Criteria for Restoration Planning

Criteria	Interpretation
On-site restoration	On-site projects (within or adjacent to the effected environment) are preferred to projects further upstream in the Lower Fox River and Green Bay watershed or adjacent watersheds.
Addresses/incorporates restoration of "preferred" resources and services as evidenced in prescribed tribal, federal, state mandates and priorities for injured resources, endangered or threatened species or species habitats.	Priorities include wetlands, fish communities, specific aquatic habitats, endangered species, and native species.

6.4.2.2 *Restoration Project Implementation Criteria*

These evaluation criteria relate to project implementability, feasibility, and cost-effectiveness.

Table 6.3
Implementation Criteria for Restoration Planning

Criteria	Interpretation
Benefits can be measured for success.	Projects will be evaluated in terms of whether the benefits can be quantified and the success of the project determined. Projects can be scaled to provide restoration of appropriate magnitude. Small projects that provide only minimal benefit relative to injured resources or larger projects that cannot be appropriately reduced in scope are less favored.
Is cost effective, including planning, implementation, and long term operation, maintenance, and monitoring.	Project with a high ratio of expected benefits to expected cost are preferred. This may be assessed relative to other projects that benefit the same resource.
Uses established, reliable methods/technologies known to have a high probability of success.	Projects will be evaluated for their likelihood of success given the proposed methods. Factors that will be considered include whether the proposed technique is appropriate to the project, whether it has been used before, and whether it has been successful. Projects incorporating wholly experimental methods, research, or unproven technologies will be given lower priority.
Is consistent with tribal, federal or state priorities, policies, mission, goals and planning.	Project is consistent with priorities, policies, mission, goals and planning such as species recovery plans, and is administratively feasible.

6.4.2.3 *Restoration Project Benefits Criteria*

These evaluation criteria relate to the types, timing, and permanence of benefits provided by the project.

Table 6.4
Benefit Criteria for Restoration Planning

Criteria	Interpretation
Provides the greatest scope of ecological, cultural, and economic benefits to the largest area or population.	To the degree that a bigger project results in greater good, bigger projects are better. Projects that benefit more than one injured resource or service will be given priority. Projects that avoid or minimize additional natural resource injury, or environmental degradation will be given priority.
Provides benefits not being provided by other restoration projects being implemented/funded under other programs.	Preference is given to projects, or aspects of existing projects, that are not already being implemented or have no planned funding under other programs. Although the Co-trustees will use restoration planning efforts by other programs, preference is given to projects that would not otherwise be implemented without NRDA restoration funds.
Aims to achieve environmental equity and environmental justice.	A restoration project should not have disproportionate high costs or low benefits to a localized population.
Maximizes the time over which benefits accrue.	Projects that provide benefits sooner are preferred. Projects that provide longer term benefits are preferred.

6.5 Administrative Record

An administrative record will be maintained at the U.S. Fish and Wildlife Service, Green Bay Ecological Services Field Office, Lower Fox River and Green Bay PCB Site Reading Room. All pertinent documents relating to the restoration will be cataloged and an index will be available at http://midwest.fws.gov/nrda/index.html. The Reading Room will be open to the public during normal office hours.

CHAPTER 7
PUBLIC COMMENT ON DRAFT EA AND RESPONSE

This chapter will be completed during the finalization of the restoration plan and environmental assessment.

CHAPTER 8
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